A Finer Examination of the Role That Negative Affect Plays in the Relationship Between Paternal Alcoholism and the Onset of Alcohol and Marijuana Use*

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ABSTRACT. Objective: This study was designed to separately examine the relations between four fundamental components of negative affect (sadness, fear, guilt, and hostility) and the onset of substance use. An additional goal was to examine the potential mediating roles that these components of negative affect play in the relationship between paternal alcoholism and the initiation of substance use. **Method:** The sample included 200 adolescents ages 15-19 years (62% girls; 68% white; 56% children of alcoholics [COAs]) and their fathers. The adolescents were followed up 5 years later when they were in early adulthood. Participants completed a clinical psychiatric interview and self-report questionnaires that assessed negative affect and substance use. **Results:** Results from structural equation modeling indicated that higher levels of hostility and lower levels of guilt were associated with earlier substance-use initiation. In addition, hostility played an indirect role in the relationship between paternal alcoholism and the onset of marijuana use, with COAs reporting higher hostility levels than non-COAs and higher hostility predicting earlier marijuana use. **Conclusions:** These results underscore the importance of separately examining different components of negative affect when investigating the role that negative affect plays in substance use. (*J. Stud. Alcohol Drugs* **70:** 400-408, 2009)

CHILDREN WHO HAVE A PARENT with a substance-use disorder have an elevated risk of using alcohol and drugs and developing substance-use problems (Chassin et al., 2004; Ohannessian et al., 2005). Moreover, differences in substance use between children who have a parent with a substance-use disorder and those who do not are apparent early. For example, studies have shown that children of alcoholics (COAs) first experiment with alcohol and drugs at a younger age than do non-COAs (Chassin et al., 2002; Dawson, 2000). This is disconcerting because research has indicated that adolescents who have an early onset of substance use are significantly more likely to develop substance abuse or dependence in comparison with those who initiate substance use later (Chassin and Ritter, 2001; Prescott and Kendler, 1999). Therefore, it is especially crucial for research to examine the underlying processes involved in the onset of substance use, particularly in individuals at high risk for substance-use problems.

Negative affect and substance use

Theoretical models and empirical research suggest that negative affect may play an important role in the onset of substance use and subsequent substance-use problems. According to the negative-affect regulation model, an elevated risk for substance-use problems results from the use of alcohol or drugs as a means of coping, with the specific goal being to reduce negative affect (Schuckit et al., 2006; Sher, 1991). Ultimately, such drinking and drug-use motives may lead to substance-use problems. In general, research has supported the negative-affect regulation model. For instance, studies have found that problem drinkers report higher levels of drinking to cope with negative affect than do nonproblem drinkers (Carey and Carey, 1995; Carpenter and Hasin, 1999). In addition, research examining individuals who have a parent with a substance-use disorder has found that they exhibit higher levels of negative affect in comparison with those that do not have a parent with a substance-use disorder (Chassin and Ritter, 2001; Clark et al., 1999; Shoal and Giancola, 2001). Negative affect also has been linked to substance use during adolescence (Desrichard and Denarie, 2005; Hussong and Hicks, 2003; Shoal and Giancola, 2001; Wills et al., 1999).

Although many studies have found high levels of negative affect to be related to substance use, in some studies, the relationship between negative affect and substance use has been relatively weak. In addition, other studies have failed to find a relationship between negative affect and adolescent substance use (Clark et al., 1999; Shoal et al., 2005). There are numerous possible explanations for the differential findings relating to negative affect across studies. For example, some studies have examined high-risk adolescents (Clark et al., 1999), whereas others have examined community samples of adolescents (Hussong and Hicks, 2003; Wills et al.,

Received: August 11, 2008. Revision: November 6, 2008.

*This research was supported by National Institutes of Health grants 5P50-AA03510 and 1K01-AA015059.

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1999). In addition, some investigations have used clinical diagnostic measures to assess negative affect (e.g., Clark et al., 1999), whereas others have used self-report, parent-report, or teacher-report measures of symptomatology (e.g., Desrichard and Denarie, 2005; Hussong and Hicks, 2003; Shoal et al., 2005). Finally, a variety of indicators of substance use have been examined.

Nevertheless, the most striking difference across studies examining negative affect and substance use relates to the construct of negative affect itself. Most studies conducted to date have used a *general,* global indicator of negative affect (e.g., Hussong and Hicks, 2003; Shoal et al., 2005). These general measures typically have combined items relating to various types of negative affect, including depression, anxiety, internalizing symptomatology, mood, self-derogation, harm avoidance, neuroticism, jealousy, and perceived loss of control. The difference in measurement of negative affect across studies provides little assurance that the same construct, or even a similar one, has been assessed.

Clearly, it is crucial to separately examine the primary components of negative affect that have been previously assessed to obtain an accurate picture of the role that negative affect plays in substance use during adolescence. Broadly, negative affect is defined as the tendency to experience states such as sadness, fear/anxiety, guilt, and anger/hostility (Watson and Clark, 1984, 1990). Therefore, it is important to differentiate the role that each of these distinct components of negative affect plays in adolescent substance use.

Sadness and substance use

There is a fair amount of evidence to suggest that a relationship exists between depression (particularly sadness) and adolescent substance use (Kaplow et al., 2001; Stice et al., 2004; Windle and Windle, 2001). However, not all studies have found a significant association between depression and adolescent substance use (e.g., Hussong and Hicks, 2003). It is important to note that, in the majority of studies in which a significant relationship has been observed, clinical measures have been used to assess depression. Such measures typically include items relating to aspects of depression other than sadness (e.g., irritability, anxiety, academic problems), making the findings relating to depression just as murky as those relating to general indicators of negative affect.

Fear and substance use

The current literature relating to fear and adolescent substance use is quite mixed. Typically, investigators have assessed the broader construct of anxiety. Some investigations have found anxiety to be a risk factor for the early initiation of substance use (e.g., Kaplow et al., 2001). In contrast, other studies have found anxiety to behave more as a protective factor, delaying the onset of substance use (e.g., Costello et al., 1999). Finally, other studies have failed to find any relationship between anxiety and substance use during adolescence (e.g., Hussong et al., 1998).

Research focusing specifically on the relation between fear and substance use is relatively sparse. Similar to the research on anxiety, some research suggests that children with lower levels of fear are at risk for substance-use initiation because they are more likely to engage in risky behaviors in comparison with more fearful children (Wills et al., 1999). However, other studies focusing on college students (Hussong et al., 2001) and adolescent males (Shoal et al., 2005) have failed to find a significant association between fear and substance use. Clearly, additional research focusing on the role that fear may play in substance use in both adolescent boys and girls is needed.

Guilt and substance use

Only a handful of studies have examined the relationship between guilt and substance use, and these studies have yielded inconsistent results. In a series of studies conducted by Dearing et al. (2005), guilt was found to be negatively related to alcohol and drug problems in samples of college students and inmates. In contrast, in other studies examining college students, guilt has been found to be positively related to substance use. For example, in a daily process study conducted by Hussong et al. (2001), drinking was found to predict guilt. However, it should be noted that guilt did not predict drinking. It is difficult to compare the results relating to guilt across studies because of the fundamental differences in the measures and methodology. In the Dearing et al. study, a scenario-based test of self-conscious affect measure was used to assess guilt. In addition, the associations between guilt and substance use were examined at a between-persons level. In contrast, in the Hussong et al. study, an average of the sum of the presence/absence of guilt items across 21 days was used to measure guilt, and the associations between guilt and substance use were examined within individuals at a daily level. Finally, it should be noted that these studies included only individuals who were college age or older.

Hostility and substance use

Research relating to the role that hostility plays in substance use has been more consistent. Hostility has been found to predict alcohol use in both community (Hussong et al., 2001; McCreary and Sadava, 2000) and high-risk (Hussong and Chassin, 1994) samples. In addition, hostility has been found to predict increased drug use in individuals who have a substance-use problem (Rao et al., 2004). The role that hostility/anger plays in the initiation of adolescent substance use is less clear. However, in their sample of aggressive boys, Pardini et al. (2004) found that increased anger

was related to an elevated risk for alcohol-use initiation in boys who had moderate to low levels of inhibitory control.

Comparison of specific negative-affect components and substance use

To date, only a handful of investigations have included and compared different components of negative affect within the same study. Pardini et al. (2004) made a significant contribution to the field by examining the relations between different indicators of negative affect (depressed mood, fear, and anger) and the onset of alcohol use. Pardini et al. found that anger was significantly related to alcohol-use initiation, whereas depressed mood and fear were not. Using an entirely different type of methodology (28-day experience sampling), Hussong et al. (2001) examined the differential relations of specific components of negative affect (sadness, guilt, fear, and hostility) with alcohol use in a sample of 74 college students. Results indicated that weekday drinking predicted greater weekend hostility. In addition, weekend drinking predicted greater weekday hostility and guilt. Fear was found to be consistently unrelated to alcohol use.

Although studies by Pardini et al. (2004) and Hussong et al. (2001) have moved the field in a forward direction, they both are limited in certain respects. First, both studies examined only alcohol use. Research examining substances other than alcohol is needed because it is possible that specific components of negative affect are differentially related to different substances. For example, perhaps hostility is more closely linked to drug use that is less normative during adolescence. It also should be noted that neither study took parental substance use into account. The study by Pardini et al. also was limited by the weak psychometric properties of the negative-affect measures. Of concern, the measures of sadness/depression and fear had low reliabilities. The use of unreliable measures may have played a role in the absence of significant relations between these components of negative affect and alcohol use in that study. Finally, the samples of both studies were somewhat constrained. Pardini et al.'s sample included only aggressive boys, whereas Hussong et al.'s sample was limited to college students.

The present study was designed to extend the work of Pardini et al. (2004) and Hussong et al. (2001) by examining the relations between paternal alcoholism, separate components of negative affect (sadness, fear, guilt, and anger), and the initiation of *both* alcohol use and marijuana use in a sample of 15- to 19-year-old boys and girls who were followed into early adulthood. Structural equation modeling was used so that the differential relations between the specific components of negative affect with both paternal alcoholism and the onset of alcohol and drug use could be assessed *simultaneously.* Finally, the potential *mediating* role that the distinct components of negative affect may play in the relationship between paternal alcoholism and the onset of substance use was examined.

Importantly, paternal depression, paternal antisocial personality disorder, and paternal drug dependence were included as covariates in the present investigation because these psychological problems are commonly comorbid with alcohol dependence (Eiden et al., 1999; Hesselbrock et al., 1985). Moreover, these psychological problems have been shown to be related to both negative affect and offspring substance use (Essau, 2004; Ohannessian et al., 2004). Gender also was included as a covariate because the pattern of relations between the specific components of negative affect and adolescent substance use may differ by gender. For example, because depression is more common among girls than boys during adolescence (Cohen et al., 1993; Ohannessian et al., 1999) and antisocial behavior and externalizing disorders are more common among boys than girls during adolescence (Fergusson et al., 2005; Ohannessian et al., 2005), it may be that sadness is more closely linked to adolescent substance use for girls, whereas hostility is more closely associated with adolescent substance use for boys.

In sum, while taking into account comorbid paternal psychopathology and gender, the following two research questions were addressed: (1) Are the four primary components of negative affect (sadness, fear, guilt, and hostility) differentially related to the onset of substance use in adolescence? (2) Do the specific components of negative affect mediate the relationship between paternal alcoholism and the onset of substance use?

Method

Participants

The sample included adolescents and their biological fathers. The participants were drawn from a larger longitudinal study (The RISK project; Houston et al., 2005) that was designed to follow offspring of alcohol- and/or drug-dependent fathers longitudinally, along with a comparison group of offspring who had fathers without a substance-dependence diagnosis. The RISK project began in 1993 and is currently ongoing. The present study is based on Time 1 data (collected between 1993-1998) and Time 2 data (collected between 1998-2003). Only adolescents with complete data at both times of measurement were included in this study.

At Time 1, the sample included 200 adolescents ages 15-19 (62% girls; 68% white) and their fathers. The mean (SD) age of the adolescents at Time 1 was 16.76 (1.35). Fifty-four percent of the adolescents were living with their mother and biological father. When the father was absent from the home, the primary reasons for the absence were separation/divorce (26.5%) and parents never married (12%). However, only 8.7% of the adolescents reported never being able to see their father.

All of the participants were from working class families and resided in an inner city in the Northeast. The mean reported household gross income of families involved in the RISK project at Time 1 was 4.69 (2.42) on a scale ranging from 1 = $0-$9,999 per year to 9 = $150,000 per year or more. This income level is the equivalent of about $40,000 per year.

Measures

Paternal alcoholism and psychopathology. The Semi-Structured Assessment for the Genetics of Alcoholism (SSAGA) was administered to fathers to obtain lifetime diagnoses of alcohol dependence, drug dependence, depression, and antisocial personality disorder (ASPD). The SSAGA is a clinical, diagnostic psychiatric interview that assesses 17 Axis I psychiatric diagnoses and ASPD. Algorithms were created to yield diagnoses based on Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV; American Psychiatric Association, 1994) criteria. Previous studies have demonstrated that the SSAGA has strong psychometric properties (Bucholz et al., 1994; Hesselbrock et al., 1999). In the present study, 56% of fathers were diagnosed with alcohol dependence, 7% were diagnosed with depression, 15% were diagnosed with drug dependence, and 8% were diagnosed with ASPD.

Negative affect. The negative emotion scales (sadness, fear, guilt, and hostility) from the Positive and Negative Affect Schedule (PANAS; Watson, 1988) were administered at Time 1 to assess negative affect. Each of the PANAS scales includes a list of adjectives that are responded to. For example, for the sadness scale, the adjectives that participants respond to are the following: sad, blue, downhearted, alone, and lonely. Individuals are asked to respond to each adjective by rating how much they usually feel that way in general on a scale ranging from 1 = "very slightly or not at all" to 5 = "extremely."

The PANAS scales have been shown to be psychometrically sound (Locker and Cropley, 2004). Prior research has supported the construct and discriminant validity of the PANAS scales (Watson, 1988). Previous studies also have shown that the PANAS scales are reliable indicators of affect (Watson, 1988; Watson and Clark, 1990). In the RISK sample, the Cronbach's α coefficients for the sadness, fear, guilt, and hostility scales were .83, .84, .86, and .78, respectively.

Youth substance use. Alcohol-use behavior was measured at both Time 1 and Time 2 in the larger RISK project. At Time 1, 51% reported never having used alcohol at any time in their life, but this decreased to 21.3% at Time 2. Similarly, 18.1% reported alcohol use several times a month at Time 1, and this rate almost doubled (35%) at Time 2. Almost 84% reported being drunk fewer than four times in their life at Time 1, but this rate decreased to 55% at Time 2. In relation to marijuana use at Time 1, two thirds of the sample had used it fewer than 10 times in their lifetime, whereas 15% had used marijuana 100 or more times. At Time 2, 79% had used marijuana, with more than 53% of the sample using it 10 or more times.

In this study, the onset of regular drinking and the onset of marijuana use were the focus. At Time 2, all participating youth were asked the following questions: "At what age did you begin to drink regularly; that is, drinking at least once a month for 6 months or more?" "How old were you the first time you used marijuana?" Because the distributions for these variables were quite skewed, the variables were recoded as follows. For age at first marijuana use, the variable was recoded to 0 = never used, 1 = 19-22 years of age, 2 = 17-18 years of age, 3 = 15-16 years of age, 4 = 13-14 years of age, 5 = 11-12 years of age, and 6 = 10 years of age or younger. For age regular drinking began, the variable was recoded to 0 = have not begun to drink regularly, 1 = 19-22 years of age, 2 = 17-18 years of age, 3 = 15-16 years of age, and 4 = 14 years of age or younger.

Procedures

The study was approved by the University of Connecticut Health Center Institutional Review Board. Youth were recruited from the community (e.g., presentations at high schools, YMCA/YWCA, Police Athletic Leagues) and through their parents (e.g., presentations at alcohol/drug treatment programs and support groups). Individuals who were interested in participating were invited to call a research assistant for additional information and screening. Exclusion criteria included major psychiatric disorder (e.g., schizophrenia) in the fathers, a history of substance dependence (including alcohol) in the mothers (to prevent including subjects with fetal alcohol spectrum disorder), and a history of DSM-III-R (American Psychiatric Association, 1987) schizophrenia, major depressive disorder, and/or abuse/dependence on alcohol or another substance in the youth. Potential subjects also were excluded if they had a neurological or endocrine disorder, had a history of significant head injuries, or were currently taking psychoactive medications. If they were still interested after the initial phone call and none of the exclusion criteria applied, they were asked to come to the university to provide informed consent. At that time, they completed the SSAGA psychiatric interview. In addition, the youth completed the self-report questionnaires just discussed, a neuropsychological battery, and an electrophysiological battery. After completion of data collection, each participant received $100.

All of the youth were contacted for a follow-up interview and additional testing 5 years after the initial testing (Time 2). At Time 2, they again completed the SSAGA, a battery of psychosocial questionnaires, and neuropsychological testing. At the completion of data collection, they received $150. The attrition rate between Time 1 and Time 2 was 15%. Of note,

TABLE 1. Means, standard deviations, and correlations among study variables

Measure	1	2	3	4	5	6	7	8	9	10
1. Paternal alcoholism										
2. Paternal depression	.20†									
3. Paternal drug dependence	.39‡	.16*								
4. Paternal ASPD	.22†	.22†	.35‡							
5. Fear	.02	-.15	-.01	.07						
6. Hostility	.16*	-.06	.11	.15*	.44‡					
7. Sadness	.01	.05	.05	.13	.63‡	.60‡				
8 Guilt	.02	-.06	-.08	.04	.69‡	.53‡	.69‡			
9. Marijuana age at onset	.21†	.07	.21†	.24†	.02	.19†	.01	-.04		
10 Regular drinking age at onset	.09	.05	.21†	.10	.05	.06	-.02	-.07	.49‡	

Note: ASPD = antisocial personality disorder.
*$p < .05$; †$p < .01$; ‡$p < .001$.

individuals who did not participate at Time 2 did not significantly differ from those who participated at Time 2 on any of the demographic variables or the substance-use variables (negative affect was not assessed at Time 2).

Results

Descriptive statistics

The correlations among all of the variables are presented in Table 1. Consistent with the literature on comorbidty, paternal alcoholism was significantly associated with the other paternal psychopathology variables. As shown in Table 1, paternal alcoholism also was associated with youth hostility and the onset of marijuana use. Paternal depression and paternal drug dependence were not significantly associated with the negative-affect variables. However, paternal drug dependence was significantly associated with the onset of marijuana use and regular drinking. Paternal ASPD was significantly correlated with hostility and marijuana-use onset. Finally, hostility was significantly associated with marijuana-use onset (see Table 1).

A series of analyses of variance models was conducted to examine whether the negative-affect variables or the substance-use variables differed by gender. Gender differences were not observed for any of the negative-affect or substance-use variables.

Path analysis

Structural equation modeling was used to simultaneously examine the relationships between the negative-affect components and the onset of adolescent substance use and to more specifically examine whether the negative-affect components significantly mediate the relationship between paternal alcoholism and offspring substance use. As discussed previously, paternal depression, paternal drug dependence, and paternal ASPD were included as covariates. A path diagram of the conceptual specified model is illustrated in Figure 1.

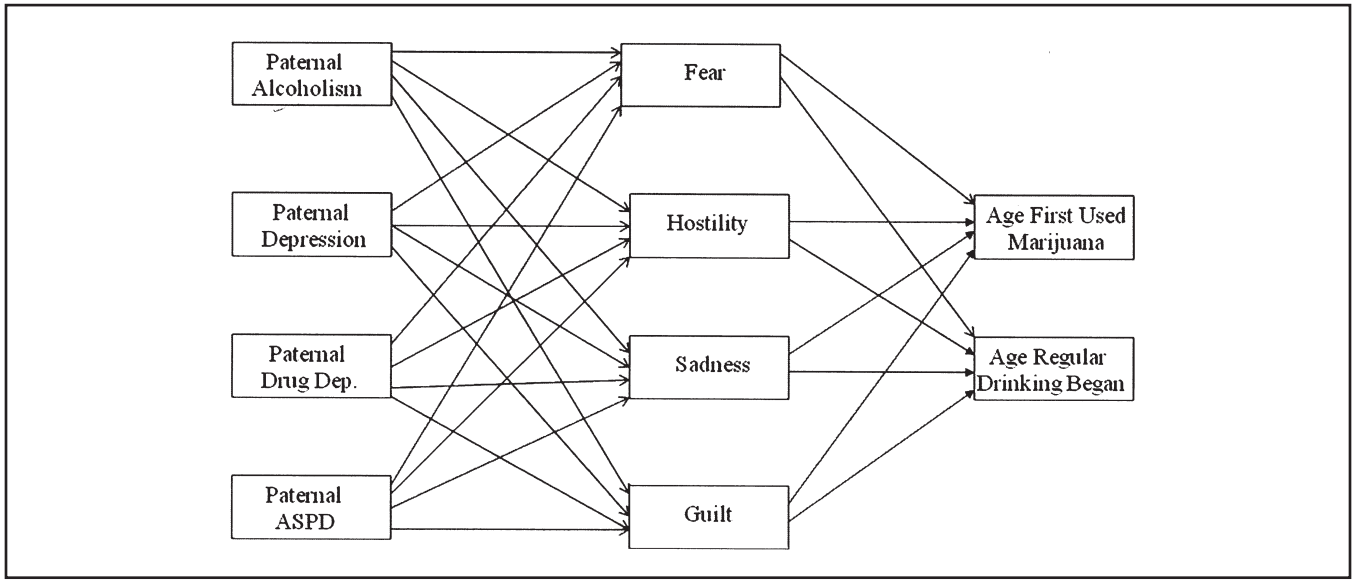

FIGURE 1. The conceptual specified model. Note: Covariance arrows were not drawn between the paternal psychopathology measures for ease of presentation. ASPD = antisocial personality disorder; dep. = dependence.

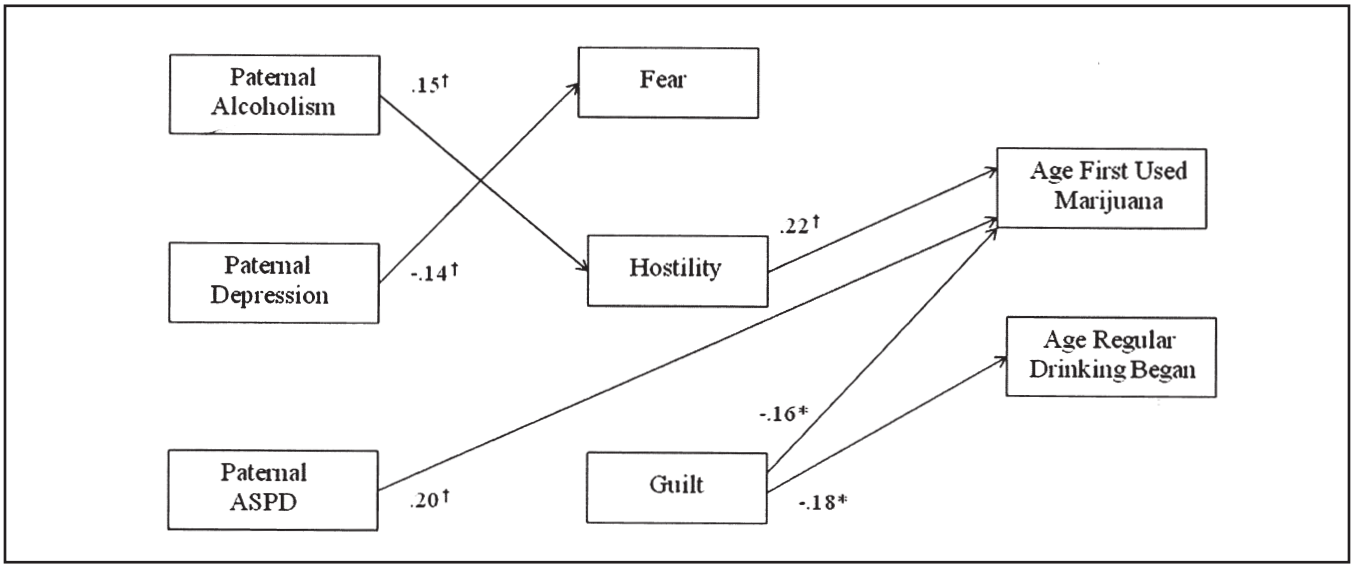

FIGURE 2. The final standardized trimmed model. ASPD = antisocial personality disorder.
*$p < .05$; †$p < .01$.

Four models were conducted. The first model tested a fully saturated model, which also included nonspecified direct paths. The second model tested the specified model (see Figure 1). This model also included direct paths that were significant in Model 1. The third model was a streamlined model. This model included only paths that were significant in Model 2. The fourth model was identical to the third model, except that this model allowed for disturbance terms with modification indices greater than 4.0 to be correlated.

The first model (the saturated model) did not provide an ideal fit ($\chi^2 = 452.93$, 23 df, $p = .00$; normed fit index [NFI] = .21; comparative fit index [CFI] = .16; root mean square error of approximation [RMSEA] = .31). In this model, the only direct paths that were significant were between paternal drug dependence and the onset of regular drinking ($\beta = .19$, $p < .05$), and between paternal ASPD and the onset of marijuana use ($\beta = .17$, $p < .05$). These paths were retained in subsequent models. Of note, no significant gender effects were observed. The overall fit of the second model was not improved over the first model ($\chi^2 = 463.68$, 31 df, $p = .00$; NFI = .20; CFI = .15; RMSEA = .27). In addition, the paths obtained were similar to the previous model. The third model also did not fit the data well ($\chi^2 = 469.97$, 41 df, $p = .00$; NFI = .18; CFI = .16; RMSEA = .23). The paths obtained in this model were similar to the prior two models.

In contrast to the previous models, the overall fit of the final model fit the data quite well ($\chi^2 = 46.97$, 34 df, $p = .07$; NFI = .92; CFI = .98; RMSEA = .04). As shown in Figure 2, the only direct path that was significant in the final model was between paternal ASPD and the onset of marijuana use ($\beta = .20$, $p < .01$), indicating that youth who had a father diagnosed with ASPD were more likely to use marijuana earlier than those without a father with ASPD. An indirect path between paternal alcoholism and age at onset of marijuana use was also observed. More specifically, paternal alcoholism significantly predicted youth hostility ($\beta = .15$, $p < .01$); in turn, hostility significantly predicted the onset of marijuana use ($\beta = .22$, $p < .01$).

In this model, paternal depression significantly predicted youth fear ($\beta = -.14$, $p < .01$), indicating that youth who had a depressed father were less fearful than those who did not. Finally, although none of the paternal psychopathology variables were significantly related to youth guilt, guilt was significantly associated with the onset of marijuana use ($\beta = -.16$, $p < .05$) and regular drinking ($\beta = -.18$, $p < .05$). These findings suggested that youth with lower levels of guilt were more likely to initiate substance use earlier in comparison with youth with higher levels of guilt.

Gender differences

A multiple group analysis was conducted to provide a more in-depth examination of gender differences. In this analysis, the regression weights were constrained to be equal across gender. A chi-square difference test indicated that the constrained model did not significantly differ from the final original unconstrained model ($\chi^2 = 2.59$, 6 df, $p = .86$), suggesting that the pattern of relations did not differ by gender.

Discussion

The literature relating to negative affect and substance use during adolescence is mixed. Some studies have found

negative affect to be significantly associated with substance use (e.g., Desrichard and Denarie, 2005; Hussong and Hicks, 2003; Shoal and Giancola, 2001), whereas others have not (e.g., Clark et al., 1999; Shoal et al., 2005). It also should be noted that the majority of studies conducted to date have used a general global indicator of negative affect, potentially masking differential relationships between specific components of negative affect and substance use. Therefore, a primary goal of this study was to separately assess the relationships between specific types of negative affect and adolescent substance use.

In the present study, sadness and fear were not significantly related to substance-use initiation. These findings mirror those found by Pardini et al. (2004). More specifically, Pardini et al. found fear and sadness to be unrelated to alcohol-use initiation in their sample of aggressive boys. The present study extends these findings to adolescent girls and boys and to marijuana use. Although the finding for sadness was consistent with the study by Pardini et al., it does conflict with many other previous studies. However, many of these other studies used measures that assessed clinical depression. Measures of clinical depression typically include items other than sadness, such as irritability, anxiety, and academic problems. It may be that these "other" indicators of depression have driven the significant relationship between depression and substance use in some of the studies where a positive relationship has been observed. In addition, in some of the studies that have found depression to play a role in adolescent substance use, problem use has been the focus. Perhaps sadness/depression plays a more salient role in problem use than onset of use. Much of the prior work examining depression and substance use also has included older individuals. Therefore, it may be that sadness/depression is more closely associated with later onset alcohol problems.

Relatively little research has been conducted on the relationship between guilt and substance use, and the handful of studies that have been conducted have yielded mixed results. In addition, to our knowledge, no one has examined the relationship between guilt and the onset of substance use during adolescence. Results from the present study indicate that adolescents with lower levels of guilt are more likely to begin drinking regularly earlier than adolescents with higher levels of guilt. These results extend those found by Dearing et al. (2005), who found guilt to be negatively related to alcohol and drug problems in college students and inmates. Perhaps a lack of guilt is indicative of conduct disorder and delinquent behavior. Individuals who exhibit delinquent behavior typically disregard societal norms and rules and the rights and feelings of others. Such individuals often display little guilt in regard to their actions. Importantly, many studies have linked delinquent behavior to substance use during adolescence (Loeber et al., 1999; Mason and Windle, 2002). Results from this study also suggest that guilt may be viewed as a "protective factor," with individuals experiencing relatively high levels of guilt being less likely to initiate early substance use.

Consistent with previous research (Hussong et al., 2001; McCreary and Sadava, 2000), hostility was found to be significantly related to marijuana use in the current study. More specifically, adolescents with higher levels of hostility were more likely to initiate marijuana use earlier than less hostile adolescents. This finding extends the previous noted relationship between hostility and alcohol use to adolescent boys and girls and to marijuana use.

A major limitation of the current literature is that the vast majority of studies examining negative affect and substance use to date have focused only on one aspect of negative affect. However, Pardini et al. (2004) and Hussong et al. (2001) examined the relationships between distinct components of negative affect and substance use in aggressive adolescent boys and in college students, respectively. The present study extended their work by examining a high-risk sample of adolescent boys and girls who were followed into young adulthood. Although the samples examined in these three studies were quite different, it is important to note that the most consistent finding to emerge across these studies relates to the role that hostility/anger plays in substance use. Hostility consistently emerged as a salient predictor of substance use. Taken together, the results from these studies suggest that hostility/anger is the component of negative affect that is most closely linked to youth substance use, including the initiation of substance use. Perhaps hostile adolescents use alcohol and/or drugs as a means to cope. Future research examining reasons for substance use and expectancies in hostile adolescents could shed light on this possibility. Alternatively, it may be that hostility is serving as a "proxy" for conduct disorder and ASPD, which have been found to be closely linked to substance use (Hesselbrock et al., 1985; Ohannessian et al., 1994). In line with this reasoning, hostility was found to be associated with the onset of marijuana use but not with regular drinking. Perhaps this is because alcohol use is relatively normative during adolescence, whereas marijuana use is more closely associated with delinquent behavior.

Another primary goal of this study was to examine the potential mediating roles that the specific negative affect components play in the relationship between parental alcoholism and the onset of substance use. In the present study, hostility was found to play an important indirect role. More specifically, COAs were found to have higher levels of hostility in comparison with non-COAs. In turn, higher levels of hostility predicted earlier marijuana use. None of the other negative affect components were involved in any of the indirect paths between paternal alcoholism and adolescent substance use, underscoring the importance of separately assessing different components of negative affect. Moreover, these results are in accordance with the results reported earlier indicating the relative salient role that hostility appears

to play in adolescent substance use. They also suggest that programs developed to prevent substance-use problems would be well advised to specifically target hostility, rather than general negative affect.

Although the present study extends the current literature, caveats should be noted. The present investigation was limited by the overarching design of the research project. In the RISK project, maternal alcohol-use disorders were an exclusion criterion in order to guard against including children with fetal alcohol spectrum disorder. Therefore, possible distinctions between paternal and maternal alcoholism and their relationships to the variables examined in this study could not be explored. Also, it is important to note that the sample assessed was a high-risk sample. Generalizing the results to others should be made with caution. In addition, similar to the majority of studies in the field, self-report, retrospective measures of substance use were used because of validity issues that plague other types of methodology (e.g., parent reports, observational methods) when examining youth substance use. Therefore, issues relating to recall and to self-disclosure may have occurred. It is important to note, however, that self-reports of substance use have been reported to be accurate (Babor et al., 1990; Sobell and Sobell, 2007), particularly when participants are assured that the data collected are confidential, as was the case in the present study. Finally, a minority of the youth reported an extremely early age at substance-use onset. Therefore, it is possible that marijuana use or regular alcohol use also may predict negative affect. Longitudinal research using nonretrospective measures of substance use is needed to thoroughly address the issue of temporality between negative affect and substance use during adolescence.

In light of the limitations, the present investigation extends the extant literature in a number of respects. Importantly, this study has demonstrated the importance of separately examining different components of negative affect when examining the role that negative affect plays in adolescent alcohol and drug use. Results from this study indicated that hostility plays a relatively salient role in the relationship between parental alcoholism and the initiation of substance use. Findings from this study suggest that if substance-use prevention programs target hostility during childhood, the initiation of substance use may be delayed. The importance of delaying the onset of substance use cannot be overstated because early substance-use onset has been shown to be linked to an elevated risk for later substance abuse and dependence (Chassin and Ritter, 2001; Prescott and Kendler, 1999).

Acknowledgments

We thank all of the participants in the RISK study. We also are grateful for all of the help provided by the RISK staff, especially Cheryl Constantine.

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